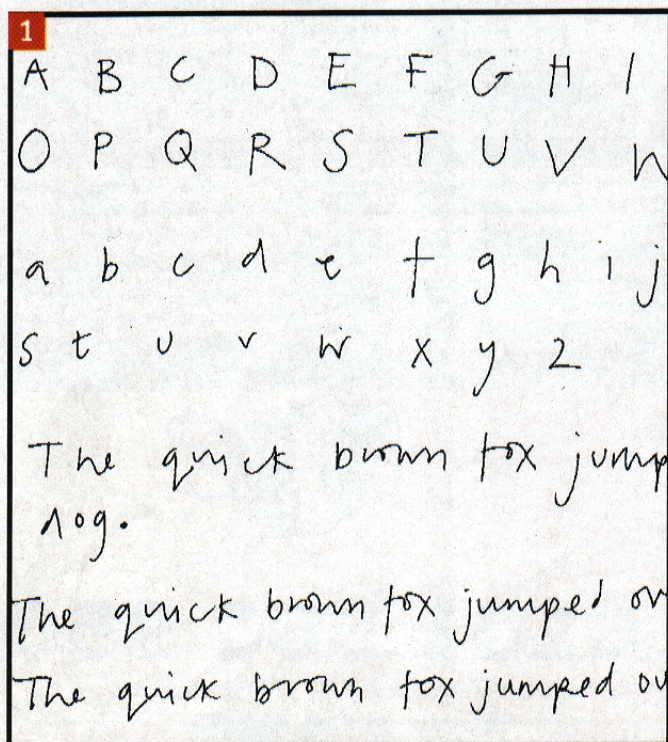# Design matters

Creating a handwriting font in Fontographer

Richard Dyce *demonstrates how deceptively fast and straightforward it is for the uninitiated to create their own handwriting font in Fontographer, despite what some typographers may tell you.*
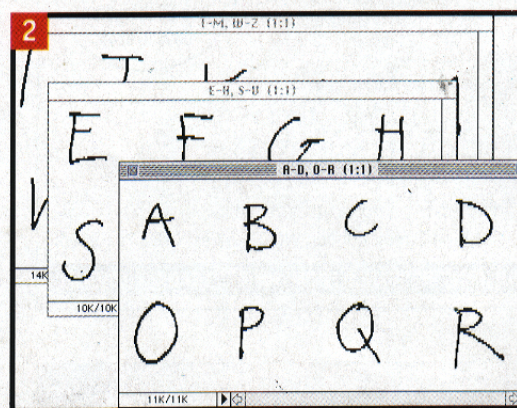
When applications like Fontographer first hit the streets and got people talking about creating fonts, the initiated who were already dab hands started to whinge about how difficult it was, how it takes years of training to do it properly, and how you can't just create a font willy-nilly. And yes, most of this is true, except by the way they wittered on about it, you'd think black magic was involved. But what they fail to tell you is that it is also great fun. And while you're not going to be able to create the next Gill Sans right away, you can devise a handwriting font fairly easily.

Your final accomplishment might be met with derision by the font foundry fraternity, but it can be created very simply and comparatively quickly, and the results can be used in a number of different ways – small restaurant menus, shop notices and school flyers are all classic examples.

Of course, you do need to have a good example of handwriting close by. Mine unfortunately qualifies as medical practitioner material, so I've enlisted the aid of Katie Bunnell, a research colleague whose handwriting is the neatest (and the most wonderfully idiosyncratic) I've ever seen.


Once you have your alphabet, it's a good idea to chop it up into sections. You can do this by pre-saving sections under useful names so you can tell which letters are in which file. These will be copied and pasted into the Fontographer file and used as templates.


When creating a new font, it's best to start off with a hand-drawn version, with all the letters and numbers roughly the same size. You'll need a black-and-white (bitmap) scan of your alphabet, preferably in PICT format, at a reasonable resolution. If you don't have a scanner, but do have a fax modem, you can always get someone to fax a page to you.
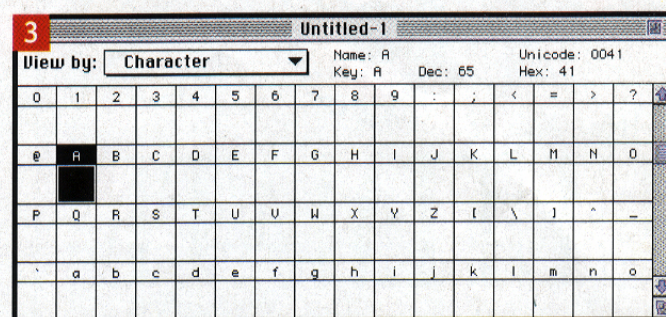
Open Fontographer and choose New from the File menu. You are now presented with a window showing all the characters that need to be created for a full font. Each character is displayed in a little box, beneath which is an empty square. This is where your character will go.
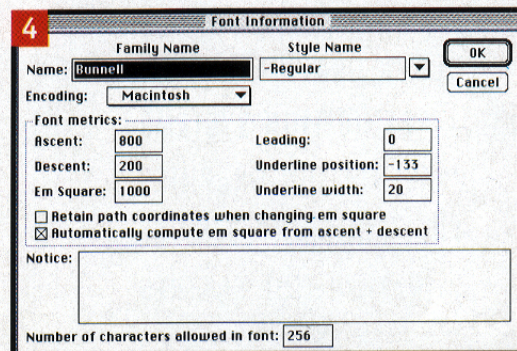
Before we go any further, it's good manners to name your font – we'll call this one Bunnell. Choose Font Info from the Element menu. A font name is made up of two parts: the Family Name and the Style Name. For example, Helvetica Bold and Helvetica Bold Italic are both different styles of the Helvetica typeface. This family information is used by type utilities such as Type Reunion to group similar fonts hierarchically on font menus. Type the name of the font into the Family Name box, and then choose Regular from the pop-up Style Name menu. Click OK.

5

Bunnell-Regular : a[97]

1119,351   1119,351   0   0
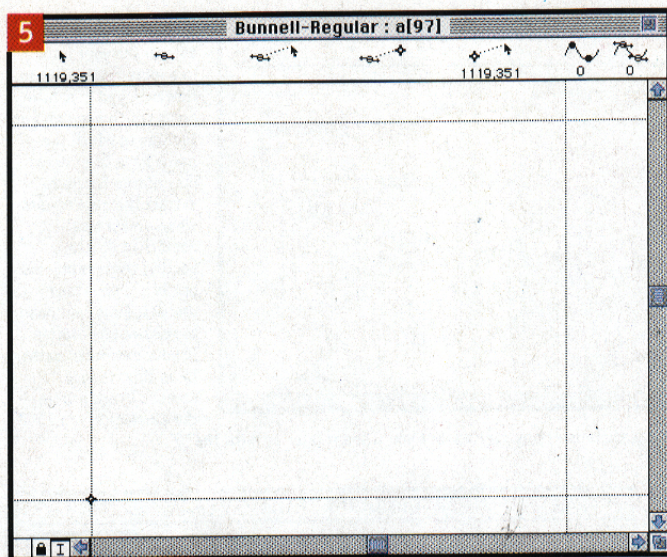
⬆ The first character, 'a', is selected, and to begin the real work, double-click on it and you will be presented with the editing window. At first sight it bears more than a passing resemblance to old versions of FreeHand or even Illustrator, which isn't really surprising as effectively it's a PostScript drawing package. The drawing area contains a simple grid with a marker, called the basepoint, set in the bottom-left of the square. The horizontal line passing through the basepoint is called the baseline, and the two vertical guides are called the left and right guides respectively. Beneath the baseline is the descender line (which you have to scroll down to see), while above the baseline is the ascender line. When creating characters, you should try to keep them within these limits.

6

Bunnell-Regular : a[97]

1092,635   1092,635   0   0

Layers
☒ Outline
☒ Template
☒ Guides
☐ Hints
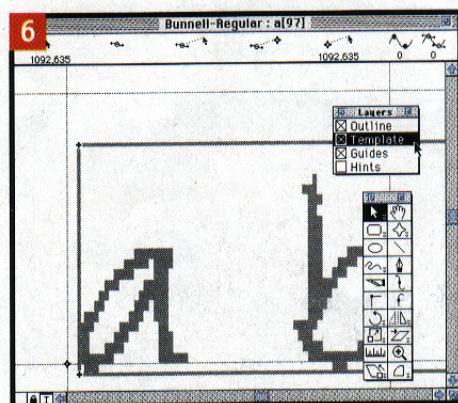
⬅ The editing window is made up of four layers: Outline, Template, Guides and Hints. You can move between these layers by clicking on them in the Layers palette. The Outline layer is where you create characters, and the Template layer is where you paste bitmap pictures that you want to copy. Switch to SimpleText, open the alphabet bitmap, copy the 'a' character, switch back to Fontographer and paste it into the drawing area. You should see the character appear greyed-out in the background (probably at the wrong scale). This is your template.

7

Bunnell-Regular : a[97]

599,306   599,306   0   0

Layers
☒ Outline
☒ Template
☒ Guides
☐ Hints
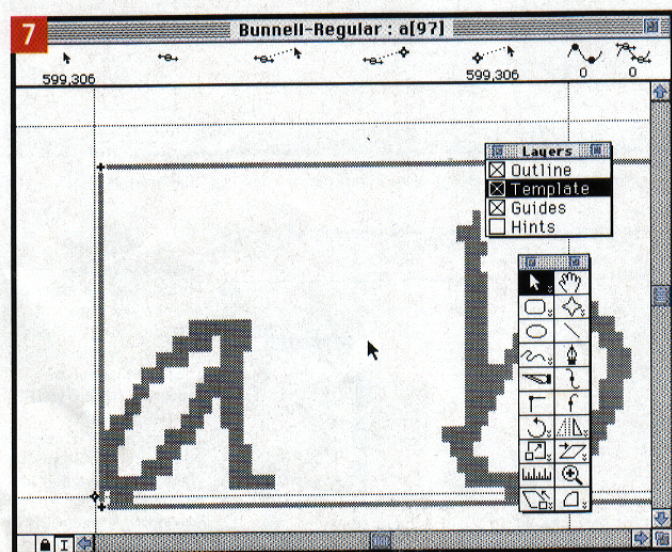
⬆ Having initially placed your template, you will find that you need to stretch it so it fills more of the em-square. Switch to the Template layer by clicking on Template in the Layers palette. You can then re-size the template by stretching one of the corner handles. To re-size proportionally, hold down the shift key as you drag. Re-size the 'a' character until it fits in about half the size of the grid above the baseline.

8

Bunnell-Regular : a[97]

547,378   547,378   0   0

Layers
☒ Outline
☒ Template
☒ Guides
☐ Hints
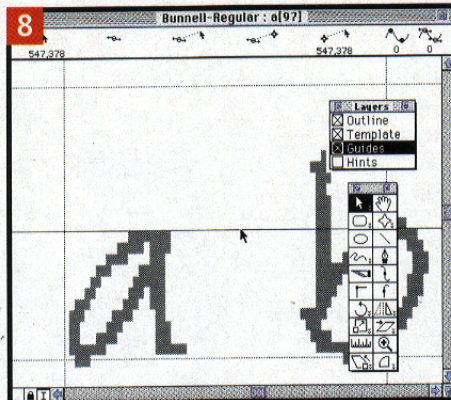
⬅ Having re-sized this particular template, it's a good idea to make sure all your lower-case characters are at least in the same ballpark when it comes to size. Switch to the Guides layer, click on the baseline and drag a guide upwards until it is touching the top of the 'a'. Release the mouse and then switch to the Outline layer. This guide, the x-height guide, is now visible for all the other characters that you edit.

9

Bunnell-Regular : a[97]

388,448   388,448   0   0

Layers
☒ Outline
☒ Template
☒ Guides
☐ Hints
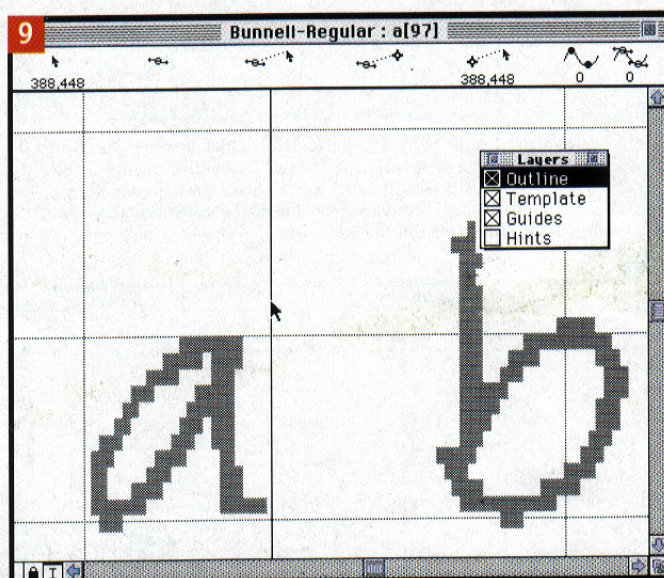
⬆ Since we are talking about guides, let's set the width of the 'a' character. Unlike a typewriter, most fonts are proportionally spaced – that is, the 'w' and the 'i' are allowed to have different widths to make the typeface easier to read. However, it also means you have to tell Fontographer how wide to make each character, and you do this by setting the right guide. In the Outline layer, drag the right-hand guide over until it is roughly up against the left-hand side of the 'a'. If you want to position the 'a' so it's exactly between the left and right guides, choose Equalize Sidebearings from the Metrics menu.

10

Bunnell-Regular : a[97]

792,309.2   792,309.2   10   0

Layers
☒ Outline
☒ Template
☒ Guides
☐ Hints
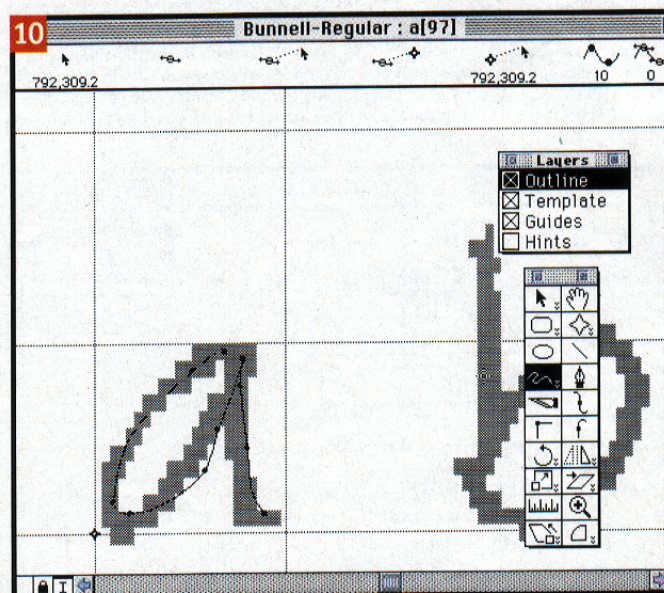
⬆ Now we're ready to create the character itself. Because we are aiming for a handwriting look, we'll use an expanded path method by first using either the freehand tool or the pen tool to draw a path that fits within the template strokes. Try to follow the way in which the character was drawn by hand, and try to ensure that the path falls in the middle of the template strokes. The freehand tool works best with a pressure tablet when you want to create 'swash' letter-forms.
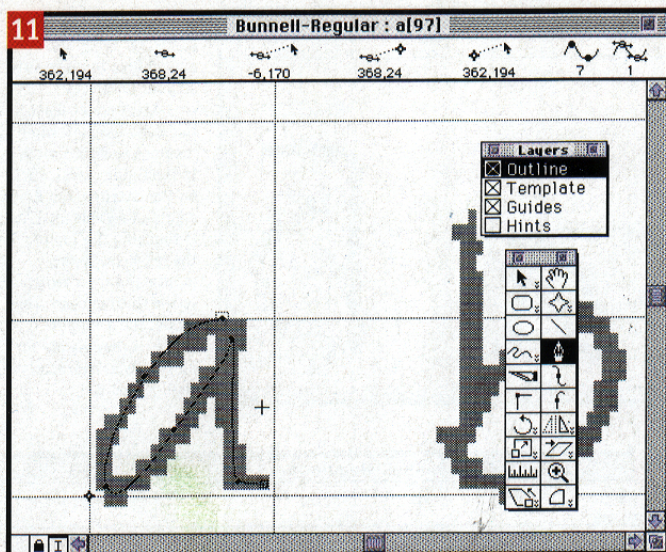
11
Bunnell-Regular : a[97]
362,194   368,24   -6,170   368,24   362,194   7   1

If freehand drawing is not your forte, you'll probably find the pen tool easier to use. Click and drag to create Bézier points, and if you want to create corner points, click and drag to set the first corner tangent, and then hold down the option key to create the second. The pen tool is very powerful, but a little experimentation should yield benefits without too much effort on your part.
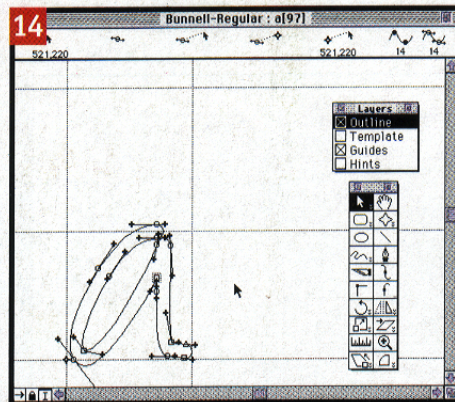
12
Bunnell-Regular : a[97]
215,102   189,130   26,-28   189,130   215,102   7   1
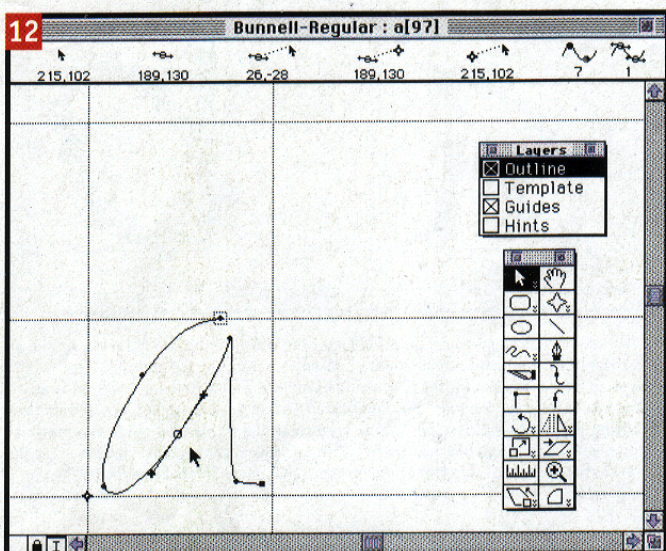
Once you've drawn a shape, you can use the selection tools or the transform tools to move points and adjust tangents until the path is just right. Don't try to make the lines match up exactly – remember, you're trying to create a handwriting font. To see how you're doing, hide the Template layer by unchecking it in the Layers palette.
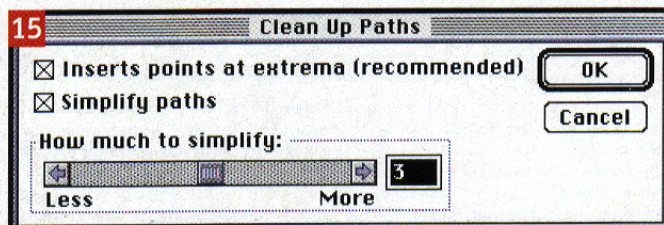
13

Expand Stroke

● **Normal pen:**

Pen width: [40] em units

Cap: Round

Join: Round

○ **Calligraphic pen:**

Pen width: [100] em units

Pen angle: [45] °

OK

Cancel
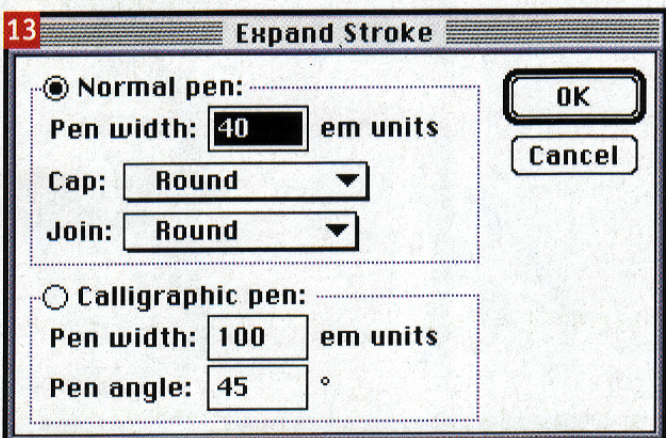
Now we're ready to expand the stroke. Choose Expand Stroke from the Element menu. Since we're looking for a ballpoint pen effect, ignore the Calligraphic pen button and insert 40 in the Pen width box. Click OK. If you don't have any paths selected before using this command, it will apply to all the paths available. If you don't like what you've chosen, simply undo it and try again with a different value. The number of multiple undos in Fontographer is set in the Preferences dialog box.

14
Bunnell-Regular : a[97]
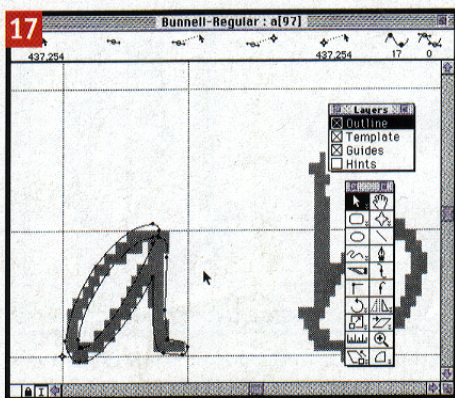521,220   521,220   14   14

You should now be able to see your letter 'a' in a more realistic form. However, you may have areas which overlap, and the way in which the paths have been drawn may not be set up to extract the best results when drawn by a PostScript device. Sorting these problems out is a three-stage process. First, you need to remove any overlap in your expanded paths. To do this, choose Remove Overlap from the Element menu.

Here, there isn't any overlap, but you'll see it later on with the 'Q'.

15

Clean Up Paths

☒ Inserts points at extrema (recommended)

☒ Simplify paths

How much to simplify:

Less ——————— More   [3]

OK

Cancel

Having removed any overlap, the next step is to simplify and optimise the paths so they can be drawn more easily by the printer. Choose Clean Up Paths from the Element menu. Again, with no paths selected, this command will apply to all the paths available. From the dialog box you can choose how much to simplify a particular character by – 3 is the default value and offers a good compromise between character shape and number of points. Click OK. Finally, you need to correct the path directions. To do this, select Correct Path Directions from the Element menu.

16
Bunnell-Regular : a[97]
455,257   455,257   17   0
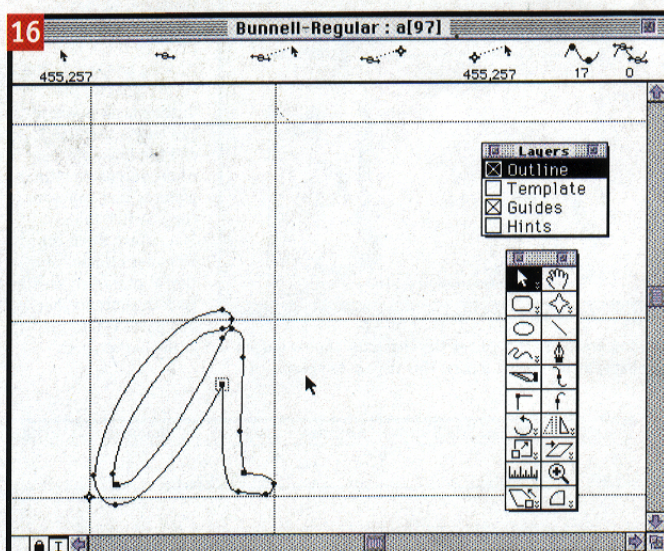
Having completed all of the above steps, you can now see your finished letter.

17
Bunnell-Regular : a[97]
437,254   437,254   17   0

Reactivate the Template layer by clicking the checkbox to see how the letter compares to the original template. It's now simply a question of repeating steps 6 to 15 for each character: pasting in a template; re-sizing it; sizing the right guide; drawing the character path; expanding it; removing the overlap; simplifying the paths; and then correcting the path directions. You can move to the next character in the table by pressing command-] and the previous character by pressing command-[. Incidentally, it's a good idea to save your font after each new letter.

18 Bunnell-Regular : Q[81]
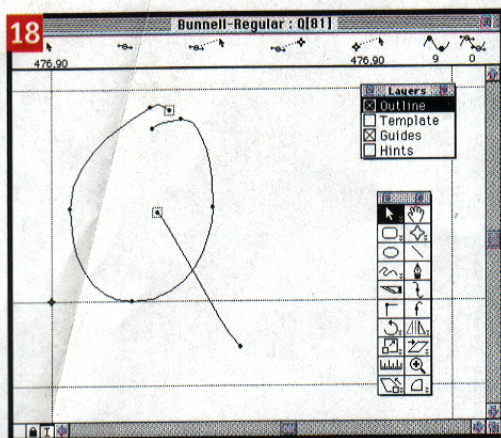
Once you get into a rhythm you soon speed up. The entire Bunnell font was encoded from a fax in about four hours. It was done on a 200MHz 6400, as Fontographer can quickly soak up the speed of non-Power Macs. To further show how the process works, here's an outline of the letter 'Q'. Notice that it doesn't join up, and is going to overlap.

19 Bunnell-Regular : Q[81]
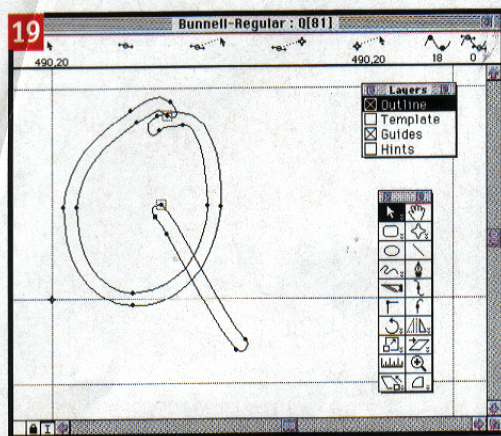
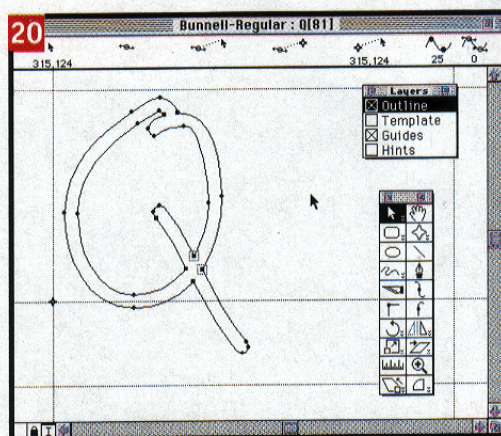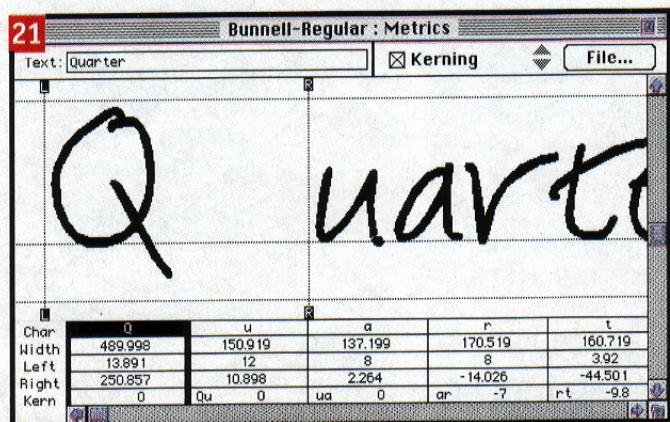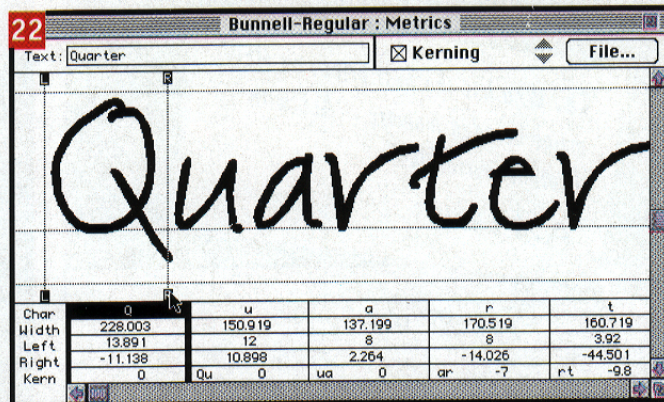Having expanded the path, you can see that in fact it overlaps in two places: the top where the path of the 'O' didn't quite meet, and the intersection of the line and the circle. As well as the letters and numbers in the alphabet, you will also need to create characters for punctuation marks (!@£$?%&), and foreign characters (éüïøñ).
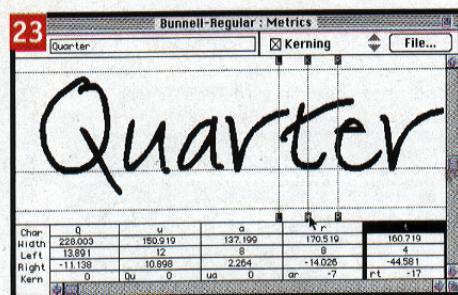
20 Bunnell-Regular : Q[81]

Choosing Remove Overlap from the Element menu now creates a character which is almost finished. All that's left to do is clean it up and correct the paths, although bear in mind that the right-hand guide hasn't yet been set. Once you've created all the character shapes you need, you're halfway there.

21 Bunnell-Regular : Metrics

Text: Quarter   ☒ Kerning   File...

| Char	Q	u	a	r	t
Width	489.998	150.919	137.199	170.519	160.719
Left	13.891	12	8	8	3.92
Right	250.857	10.898	2.264	-14.026	-44.501
Kern		Qu	ua	ar	-7	rt	-9.8

Choose Open Metrics Window from the Windows menu. This window might look pretty complicated, but it's actually fairly straightforward and great fun to use. Basically, this is where you correct the spacing of the letters in the font and create special 'kerned pairs' that make the difference between a good and a bad font. By typing characters into the Text box at the top, you can see what they look like in your font. Clicking on a character brings up markers for the left and right guides.

22 Bunnell-Regular : Metrics

Text: Quarter   ☒ Kerning   File...

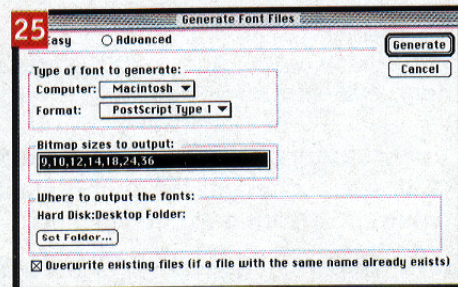| Char	Q	u	a	r	t
Width	228.003	150.919	137.199	170.519	160.719
Left	13.891	12	8	8	3.92
Right	-11.138	10.898	2.264	-14.026	-44.501
Kern	0	Qu	0	ua	0	ar	-7	rt	-9.8

By dragging the left or right marker beneath the selected character, you can change its individual guide settings. This is the same as adjusting the guides in the editing window, with the crucial difference that you can do it in relation to other characters. Here the width of the 'Q' has been corrected by dragging the R symbol in towards it.

23 Bunnell-Regular : Metrics

Quarter   ☒ Kerning   File...

Char	Q	u	a	r	t
Width	228.003	150.919	137.199	170.519	160.719
Left	13.891	12	8	8	4
Right	-11.138	10.898	2.264	-14.026	-44.581
Kern		Qu		ua		ar	-7	rt	-17

As well as altering the width, you can also create kerned pairs. In most cases the width of a character is enough to determine where it goes on a line, but sometimes you might want to fit letters closer together or further apart than normal spacing allows. For example, the 't' here can be moved closer to the 'r'. By dragging the K (the kerning marker beneath the letter), you can move it closer to the 'r'. This forms a kerned pair which is saved with the font information. You can see this information in the panel at the bottom of the window. In the kern row, the 'rt -17' tells you that the pair of letters 'r' and 't' are kerned to be 17 units closer together. You can kern any character in the text you type except the first one on the line. Kerning is the key ingredient in making a really good font, and even the most basic one will require a minimum of about 200 kerned pairs (like vowels and capitals, punctuation marks and lower case characters, and so on).

24 Bunnell-Regular : 12 pt R[82]

ascent	9
descent	3
offset	0
width	11

Recalc from outline
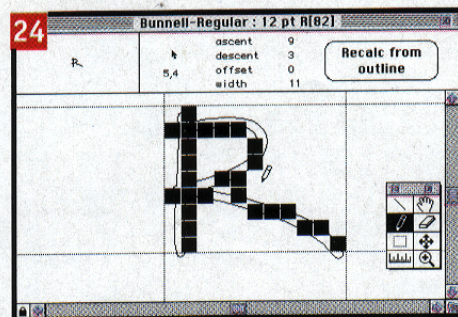
Although Fontographer makes a very good stab at creating bitmap or screen fonts automatically, it has a lot of trouble with the small sizes although, ironically, it's the smaller bitmap fonts you're most likely to want. However, you can edit the bitmap fonts yourself. To do this, choose Open Bitmap Window from the Windows menu. Here you can alter the bitmaps by using paint tools similar to ResEdit or ClarisWorks. Remember that as well as the different characters, there are also the different bitmap font sizes to contend with, so it's best to leave bitmap editing unless a) you're desperate or b) you have another four days to spare.

25 Generate Font Files

Easy   ○ Advanced   Generate   Cancel

Type of font to generate:
Computer: Macintosh ▾
Format: PostScript Type 1 ▾

Bitmap sizes to output:
9,10,12,14,18,24,36

Where to output the fonts:
Hard Disk:Desktop Folder:
Set Folder...

☒ Overwrite existing files (if a file with the same name already exists)

Having created your character shapes, edited the widths, created the kerned pairs, and, where necessary, altered the bitmap fonts, you're now ready to create your font. Save your font before starting. Now choose Generate Font Files from the File menu. Choose the font type you want – start with 'Macintosh' and 'PostScript Type 1' and then type in the screen font sizes you want. You will probably need 9, 10 and 12, but if you're using Adobe Type Manager, any larger sizes are unnecessary. Click on Generate and Fontographer will create a font for you. The font suitcase and the PostScript font it produces can be dropped straight into any Mac System Folder, and hopefully, if everything has gone according to plan, you can use it straight away. However, if something's gone awry, or if there's something about the font you don't quite like, you can always fire up Fontographer again and have a fiddle. And you can also say goodbye to all the free time you thought you had.